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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

GEORGE C. MARSHAL / SPACEx
RELIABILITY CENTER

SATURN V

PROGRAM DIRECTIVE

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SATURN V PROGRAM DIRECTIVE NUMBER: 19 ORIGINAL ISSUE DATE: January 6, 1966

REVISION NUMBER: DATE OF REVISION:

SUBJECT: MANAGEMENT PLAN FOR CONTROL OF UNSATISFACTORY CONDITION
REPORTING FOR THE SATURN V PROGRAM

I. POLICY

A Saturn V centrally controlled UCR (Unsatisfactory Condition Reports) System shall be established for the collection of unsatisfactory condition data reported on flight hardware and associated launch support equipment for Saturn V Launch Vehicles. This system shall be compatible with the existing MSFC failure reporting system and shall employ the most up-to-date retrieval methods considered feasible.

II. PURPOSE

To establish a Management Plan for:

- o Controlling flow of UCRs.
- o UCR Central Control responsibility.
- o Supporting assessment of flight readiness.
- o Recurrence control actions.
- o Rapid information links for priority UCRs.
- o Status reporting to Project (Stage) and Program Offices.
- o Other related matters.

III. SCOPE

This Management Plan applies to all failures and discrepancies found during:

- o Post-manufacturing checkout.
- o Pre-captive firing checkout.
- o Captive firing (acceptance firing).

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- o Post-captive firing checkout.
- o Pre-launch checkout.
- o Launch (flight).

This plan covers all Saturn V Stages, IU, and LVGSE.

IV. DEFINITIONS

- A. Unsatisfactory Condition - Any failure or discrepancy discovered on the flight hardware or associated launch support equipment of Saturn V Launch Vehicles during the time period beginning with post manufacturing checkout at the stage contractor's plant and extending through the operational life of the equipment concerned.
- B. Unsatisfactory Condition Report (UCR) - Any report submitted by a NASA or contractor organization documenting failures or discrepancies as defined in the preceding paragraph.
- C. Flight Readiness Action - Immediate remedial or corrective action to resolve unsatisfactory conditions so that flight readiness is complete.
- D. Recurrence Control Action - The corrective action taken to prevent an unsatisfactory condition from recurring on subsequent launch vehicles or their associated ground support equipment.
- E. Hardware Criticality Category or Failure Severity - Terms used to describe the impact of a particular failure of equipment on crew safety or mission success. The three Hardware Criticality Categories and four Severity Classifications are illustrated in the following extract from Appendix 1.

	Hardware Criticality Category								
	1	2	3						
Failure Severity Class →	Cr	Ma	Mi	De	Ma	Mi	De	Mi	De

- o Complete definitions of Criticality Category and Failure Severity are given in Appendix 1.

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- F. Priority Action - The immediate action (preferably by telephone or datafax) taken on handwritten or soft copies of a UCR to expedite remedial action for flight readiness.
- G. Open UCRs - UCRs that have not had the appropriate corrective action are considered "open."
- H. Closed UCRs - UCRs that have had the proper corrective action are considered "closed."
- I. Failure - The inability of a system, subsystem, component or part to perform its specified function.
- J. UCR Central Control - The central point for collection, data processing, and storage of UCR information at the MSFC Quality and Reliability Assurance Laboratory (R-QUAL).

V. PLAN DESCRIPTION

- A. Data Collection - The unsatisfactory condition data collected in this system shall cover the time period as outlined in paragraph III. It shall include:
 - o All stage and associated GSE oriented failure and discrepancy reports.
 - o Related failure analysis information.
 - o Corrective action information.
- B. Government Furnished Equipment (GFE) - GFE removed under this plan shall be either:
 - o Routed to UCR Central Control under ordinary circumstances or;
 - o Routed to a repair activity as designated by the applicable Resident Office under emergency conditions.
 - When this emergency action is taken, the applicable resident office shall immediately notify UCR Central Control and the appropriate project manager.

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- C. Timing - Rapid data retrieval and transmission methods shall be stressed so that evaluation and dissemination of data be timely. Data from failure and discrepancy reports shall be collected and forwarded to UCR Central Control:
- o From contractor sites within 10 days from the time the failure was discovered. (Failure analysis and corrective action data will be collected and submitted normally within 30 days.)
 - o For UCRs written at KSC, the time from initiation to reception at UCR Central Control shall be reduced to a maximum of 5 days.
 - o UCR Central Control will follow-up to obtain failure analysis and corrective action information.

VI. RESPONSIBILITY

A. KSC Quality and Reliability Assurance Laboratory

That Laboratory shall be responsible for operating the UCR Central Control for handling UCR information which includes:

- o Collecting and processing UCRs.
- o Operation of Automatic Data Processing System.
- o Classifying failures to define problem areas.
- o Determination of adequacy of corrective action.
- o Follow-up to assure recurrence control.
- o Reporting of UCR information.

B. KSC Reliability and Quality Office

That office shall:

- o Supply copies of all UCRs to:
 - Saturn V Reliability and Quality Office (I-V-Q).

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- UCR Central Control (MSFC Quality and Reliability Assurance Laboratory, R-QUAL).
- MSFC/Saturn V Resident Office at KSC (I-K-V).
- o Provide serialized control over all failure reports at KSC.
- o Be responsible for directing the contractor in performing on-the-spot failure analysis under emergency conditions.
- o Establish procedures for routing failed hardware to the applicable failure analysis location with a minimum of delay.

C. Saturn V Reliability and Quality Office (I-V-Q)

That office shall be responsible for:

- o Planning and coordination to assure that all elements necessary to the working of this plan are implemented and properly maintained.
- o Being the focal point in Saturn V for all UCRs on the Saturn V Stages, IU, and Launch Vehicle GSE.
- o Processing UCR information immediately upon receipt.
- o Preparing applicable reports to the Project (Stage) and Program Offices.
- o Serving as the MSFC contact point for coordination of Saturn V failure information with NASA Headquarters and other Centers.
 - See Appendix 3 for Procedure for Handling Priority UCRs.

D. Saturn V Project (Stage) Offices

Those offices shall be responsible for:

- o Implementing the necessary contractual requirements with their respective stage contractors to assure

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the needed flow of failure information to the UCR Central Control.

- o Initiating contractual action for corrective action involving design or other changes when necessary.
- o Approving and coordinating the distribution of failure reports and information to contractors.

E. The MSFC/Saturn V Resident Office at KSC (I-K-V)

That office shall be responsible for transmitting:

- o Action copies of priority UCRs to other resident offices and/or project managers.
- o Information copies of priority UCRs to
 - UCR Central Control (R-QUAL).
 - Saturn V Reliability and Quality Office (I-V-Q).



Arthur Rudolph
Manager, Saturn V Program

Attachments:

1. Appendix 1, Unsatisfactory Condition Report Summary
2. Appendix 2, MSFC Unsatisfactory Condition Reporting System
3. Appendix 3, Procedure for Handling Priority Items within I-V-Q.

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APPENDIX 1 TO MANAGEMENT PLAN FOR CONTROL OF UNSATISFACTORY
CONDITION REPORTING FOR THE SATURN V PROGRAM
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Hardware Criticality Category - This describes the impact of failure of equipment on crew safety or mission success. The three categories are:

- o Category 1 - Those items whose failure may result in loss of crew.
- o Category 2 - Those items whose failure may result in loss of mission.
- o Category 3 - Those items whose failure does not affect mission success or crew safety.

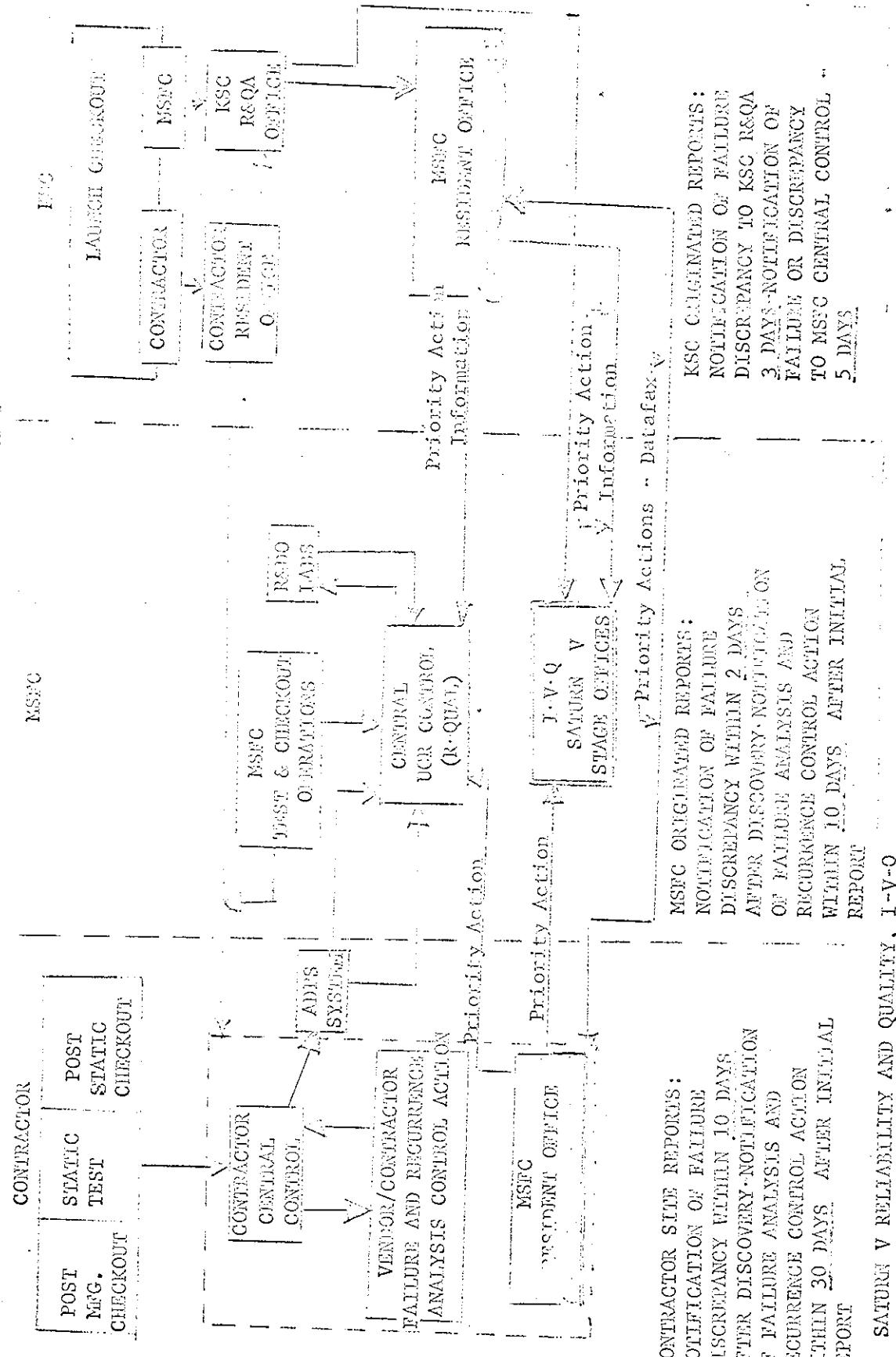
Failure Severity Classification - This refers to the severity of the discrepancy and is related to the hardware criticality categories. There are four classifications:

- o Critical (Cr) - Failures that may affect crew safety.
- o Major (Ma) - Failures that may affect mission success but not crew safety.
- o Minor (Mi) - Functional failures that will not affect crew safety or mission success.
- o Defect (De) - Any failure or discrepancy other than those listed above.

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APPENDIX 2 TO MANAGEMENT PLAN FOR CONTROL OF UNSATISFACTORY CONDITION REPORTING FOR THE SATURN V PROGRAM (SATURN V PROGRAM DIRECTIVE NUMBER 19)

MSFC/PROMPT UNSATISFACTORY CONDITION REPORTING SYSTEM



APPENDIX 2 to Saturn V Program Directive Number 19

CONTRACTOR SITE REPORTS:
NOTIFICATION OF FAILURE DISCREPANCY WITHIN 10 DAYS AFTER DISCOVERY. NOTIFICATION OF FAILURE ANALYSIS AND RECURRANCE CONTROL ACTION WITHIN 30 DAYS AFTER INITIAL REPORT
SATURN V RELIABILITY AND QUALITY, I-V-Q

MSFC ORIGINATED REPORTS:
NOTIFICATION OF FAILURE DISCREPANCY WITHIN 2 DAYS AFTER DISCOVERY, NOTIFICATION OF FAILURE ANALYSIS AND RECURRANCE CONTROL ACTION WITHIN 10 DAYS AFTER INITIAL REPORT
KSC ORIGINATED REPORTS:
NOTIFICATION OF FAILURE DISCREPANCY TO KSC R&QA 3 DAYS. NOTIFICATION OF FAILURE OR DISCREPANCY TO MSFC CENTRAL CONTROL 5 DAYS

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APPENDIX 3 TO MANAGEMENT PLAN FOR CONTROL OF UNSATISFACTORY
CONDITION REPORTING FOR THE SATURN V PROGRAM
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PROCEDURE FOR HANDLING PRIORITY ITEMS WITHIN I-V-Q

I-V-Q will

- o Evaluate, code, and record
 - All identification information
 - Hardware criticality
 - Failure severity
 - Close-out action
 - Recurrence record
 - Description
 - Previous and future stage use
 - Other items
- o Forward applicable reports and comments to
 - Saturn V Program Manager (I-V-MGR)
 - Stage and Project Managers
 - Apollo Program Office (MAR)
- o Update applicable charts in Saturn V Program Control Center

APPENDIX 3 TO SATURN V PROGRAM DIRECTIVE NUMBER 19